

LISTING OF CLAIMS

Claim 1 (previously amended): A light emitting device, comprising:

a plurality of organic light emitting diode (OLED) modules electrically connected in series, each of said OLED module comprises an organic layer, which emits light when activated; and

an alternating current (AC) power source electrically connected to and providing an AC voltage directly to the plurality of OLED modules, said voltage and said current having a waveform characteristic.

Claim 2 (previously amended): A light emitting device, comprising:

a substrate; and

C¹ a plurality of organic light emitting diode (OLED) series groups provided on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series, wherein each OLED module comprises an organic layer that emits light when activated, and the OLED modules emit light upon application of an AC voltage supplied directly thereto, and the AC voltage has a waveform characteristic.

Claim 3 (original): The light emitting device of claim 2, further comprising:

at least one first conducting line provided on the substrate, the at least one first conducting line electrically connected to a first end of each OLED series group; and

a second conducting line provided on the substrate, the second conducting line electrically connected to a second end of each OLED series group opposite the first end.

Claim 4 (previously amended): A light emitting device, comprising:

a substrate;

a plurality of organic light emitting diode (OLED) series groups provided on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series;

at least one first conducting line provided on the substrate, the at least one first conducting line electrically connected to a first end of each OLED series group;

a second conducting line provided on the substrate, the second conducting line electrically connected to a second end of each OLED series group opposite the first end;
and

a converting circuit that converts an applied AC voltage with a sinusoidal waveform to a converted voltage waveform, and applies the converted voltage waveform to the at least one first and the second conducting lines;

wherein each OLED module comprises an organic layer that emits light when activated, and the OLED modules emit light upon application of an AC voltage.

Claim 5 (original): The light emitting device of claim 4, wherein the converting circuit comprises back-to-back zener diodes, and the converted voltage waveform is a clipped sine wave.

Claim 6 (original): The light emitting device of claim 4, wherein the converted voltage waveform has a first time period during which the voltage is positive and a second time period during which the voltage is negative, and the first time period is approximately equal to the second time period.

Claim 7 (original): The light emitting device of claim 4, wherein the converting circuit comprises an oscillator that provides a driving frequency of the converted voltage waveform, where the driving frequency is different than a frequency of the sinusoidal waveform.

Claim 8 (original): The light emitting device of claim 7, wherein the converted voltage waveform is a square pulse waveform.

Claim 9 (original): The light emitting device of claim 7, wherein the converted voltage waveform has a frequency greater than about 10 kHz.

Claim 10 (previously amended): A light emitting device, comprising:

a substrate;

a plurality of organic light emitting diode (OLED) series groups provided on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series; and

an alternating current (AC) power source, electrically connected to and providing an AC voltage to the first and second conducting lines;

wherein each OLED module comprises an organic layer that emits light when activated, the OLED modules emit light upon application of an AC voltage, at least one first conducting line provided on the substrate, the at least one first conducting line electrically connected to a first end of each OLED series group, and a second conducting line provided on the substrate, the second conducting line electrically connected to a second end of each OLED series group opposite the first end.

Claim 11 (previously amended) A light emitting device, comprising:

a substrate; and

a plurality of organic light emitting diode (OLED) series groups provided on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series, and the plurality of OLED series groups arranged in rows of OLED modules;

wherein each OLED module comprises an organic layer that emits light when activated, the OLED modules emit light upon application of an AC voltage, at least one first conducting line is provided on the substrate, the at least one first conducting line being electrically connected to a first end of each OLED series group, and a second conducting line is

provided on the substrate, the second conducting line being electrically connected to a second end of each OLED series group opposite the first end.

Claim 12 (previously amended) A light emitting device, comprising:

a substrate;

a plurality of organic light emitting diode (OLED) series groups provided on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series;

wherein each OLED module comprises a respective anode and cathode, and an organic layer that emits light when activated; the OLED modules of each OLED series group are serially connected anode to cathode; the OLED modules emit light upon application of an AC voltage; at least one first conducting line is provided on the substrate, the at least one first conducting line being electrically connected to a first end of each OLED series group; and a second conducting line is provided on the substrate, the second conducting line being electrically connected to a second end of each OLED series group opposite the first end.

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Claim 13 (original): The light emitting device of claim 12, further comprising:

a plurality of circuit elements, each circuit element electrically connected in parallel with a respective OLED module.

Claim 14 (original): The light emitting device of claim 13, wherein each of the circuit elements comprises a resistor, diode or varistor.

Claim 15 (original): The light emitting device of claim 13, wherein each of the circuit elements provides for fault tolerance of a respective OLED module.

Claim 16 (original): The light emitting device of claim 12, further comprising:

a plurality of circuit elements, each circuit element electrically connected in parallel with a respective more than one OLED module.

Claim 17 (original): The light emitting device of claim 12, further comprising:

a plurality of circuit elements, each circuit element electrically connected in series with a respective OLED module.

Claim 18 (original): The light emitting device of claim 17, wherein each of the circuit elements modifies the voltage across a respective OLED module.

Claim 19 (previously amended): A light emitting device, comprising:

a substrate; and

a plurality of organic light emitting diode (OLED) series groups provided on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series, the plurality of OLED series groups arranged as part of a sign;

wherein each of the OLED modules comprises an organic layer that emits light when activated, the OLED modules emit light upon application of an AC voltage, at least one first conducting line is provided on the substrate, the at least one first conducting line being electrically connected to a first end of each OLED series group, and a second conducting line is provided on the substrate, the second conducting line being electrically connected to a second end of each OLED series group opposite the first end.

Claim 20 (previously amended) A light emitting device, comprising:

a substrate; and

a plurality of organic light emitting diode (OLED) series groups provided on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series;

wherein each of the OLED modules comprises an organic layer that emits light when activated, the OLED modules emit light upon application of an AC voltage, at least one first conducting line is provided on the substrate, the at least one first conducting line being electrically connected to a first end of each OLED series group, a second conducting line is provided on the substrate, the second conducting line being electrically connected to a

second end of each OLED series group opposite the first end, and the series groups are arranged such that first ends of the series groups have alternating polarity with respect to each other.

Claim 21 (original): The light emitting device of claim 11, wherein the series groups are arranged such that the first ends of the series groups have alternating polarity with respect to each other.

Claim 22 (previously amended) A light emitting device, comprising:

a substrate; and

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a plurality of organic light emitting diode (OLED) series groups provided on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series;

wherein the OLED modules emit light upon application of an AC voltage, at least one first conducting line provided on the substrate, the at least one first conducting line electrically connected to a first end of each OLED series group, and a second conducting line provided on the substrate, the second conducting line electrically connected to a second end of each OLED series group opposite the first end, and

wherein each OLED module comprises:

a first electrode;

at least one organic light emitting layer over the first electrode; and

a second transparent electrode over the at least one organic light emitting layer.

Claim 23 (original): The light emitting device of claim 22, wherein the second electrode comprises indium tin oxide.

Claim 24 (original): The light emitting device of claim 10, wherein the AC power source provides a voltage with a sinusoidal waveform.

Claim 25 (original): The light emitting device of claim 10, wherein the AC power source provides a voltage with a square pulse waveform.

Claim 26 (previously amended) A method of operating a light emitting device, comprising providing an AC square pulse waveform voltage to at least one first conducting line and one second conducting line, the first and second conducting lines being connected to the light emitting device, the light emitting device comprising:

a substrate; and

a plurality of organic light emitting diode (OLED) series groups provided on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series;

wherein each of the OLED module comprises an organic layer that emits light when activated, the OLED modules emit light upon application of an AC voltage, the at least one first conducting line is provided on the substrate, the at least one first conducting line being electrically connected to a first end of each OLED series group, and the second conducting line is provided on the substrate, the second conducting line being electrically connected to a second end of each OLED series group opposite the first end.

Claim 27 (original): A method of operating the light emitting device of claim 26, wherein the AC square pulse waveform voltage has a first time period during which the voltage is positive and a second time period during which the voltage is negative, and the first time period is approximately equal to the second time period.

Claim 28 (original): A method of operating the light emitting device of claim 14, comprising:

providing an AC square pulse waveform voltage to the at least one first and the second conducting lines.

Claim 29 (previously amended) A method of making a light emitting device comprising:

providing a substrate;

forming a plurality of organic light emitting diode (OLED) series groups on the substrate, each OLED series group comprising a plurality of OLED modules, the OLED modules of each OLED series group electrically connected in series, wherein each of the OLED modules comprises an organic layer that emits light when activated, the OLED modules emit light upon application of an AC voltage supplied directly thereto, and the AC voltage has a waveform characteristic.

Claims 30-45 (withdrawn)

Claim 46 (currently amended): A display comprising:

a plurality of organic light emitting diode (OLED) modules arranged to spell out at least one letter or depict an image, wherein the plurality of the OLED modules are connected electrically in series.

Claim 47 (currently amended) A display comprising:

a plurality of organic light emitting diode (OLED) modules arranged to spell out at least one letter or depict an image,

wherein each OLED module has a shape of a letter or image, and the plurality of the OLED modules are connected electrically in series.

Claim 48 (previously amended) A display comprising:

a plurality of organic light emitting diode (OLED) modules arranged to spell out at least one letter or depict an image,

wherein the plurality of OLED modules is grouped into a plurality of series groups, and the OLED modules of each series group are electrically connected in series.

Claim 49 (original): The display of claim 48, wherein each OLED module has the shape of a letter or image.

Claim 50 (canceled)

Claim 51 (currently amended): A method of making a display comprising:

providing a substrate; and

arranging a plurality of organic light emitting diode (OLED) modules to spell out a letter or depict an image; and

providing electrical connections between the plurality of OLED modules electrically to connect the plurality of OLED modules in series.

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